

# ALERT SERVICE BULLETIN

ENGINE — BLADE ASSEMBLY, 1ST STAGE, LOW PRESSURE COMPRESSOR (LPC)  
— ULTRASONIC TESTING (UT) INSPECTION AND THERMAL ACOUSTIC IMAGE (TAI)  
INSPECTION OF 1ST STAGE LPC BLADE ASSEMBLIES TO FIND AIRFOIL CRACKS

## MODEL APPLICATION

PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, PW4090-3

## BULLETIN ISSUE SEQUENCE

PW4G-112 Series A72-361

## ATA NUMBER

72-30-00

## UTC/P&W PROPRIETARY INFORMATION

This document is the property of United Technologies Corporation — Pratt & Whitney (UTC/P&W). You may not possess, use, copy or disclose this document or any information in it, for any purpose, including without limitation to design, manufacture, or repair parts, or obtain FAA or other government approval to do so, without UTC/P&W's express written permission. Neither receipt nor possession of this document alone, from any source, constitutes such permission. Possession, use, copying or disclosure by anyone without UTC/P&W's express written permission is not authorized and may result in criminal and/or civil liability.

Export Classification: Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).

## FAA Airworthiness Directive

Directive No. 2019-03-01

Directive No. 2021-05-51

## Compliance Category

1, 3

## P&W Distribution Code

2642

October 15/21

**PW4G-112-A72-361**

Page 1 of 13



## Summary

The purpose of this Alert Service Bulletin is to give Ultrasonic Testing (UT) inspection and Thermal Acoustic Image (TAI) inspection intervals for the 1st stage Low Pressure Compressor (LPC) blade assemblies, also known as the LPC fan blades.

During engine operation, stress concentrations in the LPC fan blades can start internal airfoil cracks. UT and TAI inspections are used to find internal cracks in the airfoil of the LPC fan blades. Pratt & Whitney updated inspection requirements to include an in-service UT inspection in addition to the current TAI inspection. The in-service UT inspection looks at the areas of the LPC fan blade where undetected crack growth can lead to blade fracture.

**NOTE:** This Alert Service Bulletin supersedes and is a closing action for TAI inspections required in Reference 10, Alert Service Bulletin PW4G-112-A72-268 and Reference 11, Special Instruction No. 29F-21.

**NOTE:** This Alert Service Bulletin supersedes and is a closing action for UT inspections required in accordance with References 16 and 17, Special Instruction No. 130F-21 - PW4000-112 Hollow Fan Blade Ultrasonic Inspection Special Instruction For Blades Which Have Accumulated 1000 Cycles Or Fewer Since Last Thermal Acoustic Imaging Inspection, Original Issue, dated July 1, 2021, and Revision A, dated July 28, 2021 respectively.

## Planning Information

### Effectivity Data

#### Engine Models Applicable

PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, PW4090-3  
Engine Serial Nos. — All Engines

**NOTE:** The engine serial number effectivity data and its related engine model identification contained in this Alert Service Bulletin are taken from the records of part(s) incorporation during initial manufacture.

After initial engine manufacture, but before final delivery, P&W may change part(s) in the engine or change the model identification of the engine. Such action is recorded on FAA337 forms.

To find Alert Service Bulletin PW4G-112-A72-361 models that are applicable, the owner/operator of the engine must compare the Service Bulletin List supplied with the engine as sent from P&W and the List of Changes incorporated at the Airframer from FAA337 forms to the Alert Service Bulletin PW4G-112-A72-361 Effectivity section.

The PW4090 Engine effectivity is also applicable to all the PW4090 de-rate models (PW4074D, PW4077D, and PW4084D) unless otherwise specified.

### Concurrent Requirements

There are no concurrent requirements.

### Reason

1. Problem: Inspection intervals must be defined to find potential crack sources on the internal cavities of the LPC fan blades. Such cracks can propagate and eventually lead to an airfoil fracture.
2. Cause: During engine operation, stress concentrations in the LPC fan blades can start internal airfoil cracks.



3. Solution: Give inspection intervals for UT and TAI inspections that are developed to detect internal cracks before airfoil fracture.

Description

Do UT and TAI inspections of the LPC fan blades by the requirements specified in the Compliance Section and Accomplishment Instructions.

Compliance

Category 1

Do a one time UT and TAI inspections of the LPC fan blades listed in the Material Data Section before the next revenue service flight, by the limits specified in Part A of the Accomplishment Instructions.

Category 3

Do repetitive UT and TAI inspections of the LPC fan blades listed in the Material Data Section by the limits specified in Part B of the Accomplishment Instructions.

Approval Data

The times between inspections specified in Compliance and the inspection procedures specified in the Accomplishment Instructions agree with the applicable Federal Aviation Regulations and are Federal Aviation Administration (FAA)-Approved for the engine model(s) given.

Manpower

The estimate of man-hours of labor directly necessary to do the intent of this Alert Service Bulletin are as follows:

UT Inspection Of Fan Blades Installed In An Engine

- |   |      |
|---|------|
| 1. Necessary For Removal Of The Fan Blade Fairings .....      | 2.0  |
| 2. UT Inspection Of The LPC Fan Blades .....                  | 45.0 |
| 3. Necessary For Installation Of The Fan Blade Fairings ..... | 2.0  |
| 4. Total Necessary Man-hours .....                            | 49.0 |

Removal/Reinstallation Of Fan Blades Installed In An Engine For UT Inspections Only

- |   |      |
|---|------|
| 1. Necessary For Removal Of The Nose Cone And LPC Fan Blades .....      | 3.0  |
| 2. UT Inspection Of The LPC Fan Blades .....                            | 45.0 |
| 3. Necessary For Installation Of The Nose Cone And LPC Fan Blades ..... | 3.0  |
| 4. Total Necessary Man-hours .....                                      | 51.0 |

Removal/Reinstallation Of Fan Blades Installed In An Engine For TAI Inspections Only

- |   |     |
|---|-----|
| 1. Necessary For Removal Of The Nose Cone And LPC Fan Blades .....      | 3.0 |
| 2. Necessary For Installation Of The Nose Cone And LPC Fan Blades ..... | 3.0 |
| 3. Total Necessary Man-hours .....                                      | 6.0 |



Removal/Reinstallation Of Fan Blades Installed In An Engine For UT And TAI Inspections

- |   |      |
|---|------|
| 1. Necessary For Removal Of The Nose Cone And LPC Fan Blades .....      | 3.0  |
| 2. UT Inspection Of The LPC Fan Blades .....                            | 45.0 |
| 3. Necessary For Installation Of The Nose Cone And LPC Fan Blades ..... | 3.0  |
| 4. Total Necessary Man-hours .....                                      | 51.0 |

Weight Data

No Change.

Electrical Load Data

Not Applicable.

Software Accomplishment Summary

Not Applicable.

References

1. Turbojet Engine Standard Practices Manual, Part No. 585005.
2. PW4074, PW4077 Turbofan Engines, Illustrated Parts Catalog, Part No. 51A346.
3. PW4074D, PW4077D, PW4084D, PW4090, PW4090-3, PW4090D, PW4098 Turbofan Engines, Illustrated Parts Catalog, Part No. 51A742.
4. PW4074, PW4077 Turbofan Engines, Engine Manual, Part No. 51A345.
5. PW4074D, PW4077D, PW4084D, PW4090, PW4090-3, PW4090D, PW4098 Turbofan Engines, Engine Manual, Part No. 51A751.
6. Boeing 777 Aircraft Maintenance Manual.
7. Spare Parts Notice P3117 — Introduction Of New First Stage Fan Blade Assembly.
8. PW4000 Series 112 Inch PW4074, PW4077, PW4077D, PW4084D, PW4090, PW4098 Turbofan Engines, Engine Cleaning, Inspection And Repair (CIR) Manual, Part No. 51A750.
9. Alert Service Bulletin No. PW4G-112-A72-246; Engine — Blade Assembly, 1st Stage, Low Pressure Compressor (LPC) — Ultrasonic Inspection To Detect Airfoil Cracks. Issue Sequence A72-246, PW4G-112 Series.
10. Alert Service Bulletin No. PW4G-112-A72-268; Engine — Blade Assembly, 1st Stage, Low Pressure Compressor (LPC) — Thermal Acoustic Image (TAI) Inspection To Detect Airfoil Cracks. Issue Sequence A72-268, PW4G-112 Series.
11. Special Instruction No. 29F-21 — PW4000-112 Hollow Fan Blade Thermal Acoustic Imaging Inspection Special Instruction, dated February 22, 2021.
12. NDIP-1238, PW4000 1st Stage LPC Rotor (Fan) Blade Assembly Airfoil Ultrasonic Inspection For Cracks (Fan Blade Installed Or Uninstalled) — Convex Flow Path, Latest FAA Approved Revision.
13. NDIP-1240, PW4000 1st Stage LPC Rotor (Fan) Blade Assembly Airfoil Ultrasonic Inspection For Cracks (Fan Blade Installed Or Uninstalled) — Convex Mid Span, Latest FAA Approved Revision.



14. NDIP-1241, PW4000 1st Stage LPC Rotor (Fan) Blade Assembly Airfoil Ultrasonic Inspection For Cracks (Fan Blade Installed Or Uninstalled) — Concave Mid Span, Latest FAA Approved Revision.
15. Special Instruction No. 85F-21 — PW4000-112 Hollow Fan Blade Ultrasonic Inspection Development & Data, dated May 12, 2021.
16. Special Instruction No. 130F-21 — PW4000-112 Hollow Fan Blade Ultrasonic Inspection Special Instruction For Blades Which Have Accumulated 1000 Cycles Or Fewer Since Last Thermal Acoustic Imaging Inspection, Original Issue, dated July 1, 2021.
17. Special Instruction No. 130F-21 — PW4000-112 Hollow Fan Blade Ultrasonic Inspection Special Instruction For Blades Which Have Accumulated 1000 Cycles Or Fewer Since Last Thermal Acoustic Imaging Inspection, Revision A, dated July 28, 2021.
18. FAA Airworthiness Directive 2019-03-01, Thermal Acoustic Imaging Inspection Of All Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, And PW4090-3 Turbofan Engines, With 1st-Stage Low-Pressure Compressor (LPC) Blade, Part Numbers 52A241, 55A801, 55A801-001, 55A901, 55A901-001, 56A201, 56A201-001, Or 56A221, Installed.
19. FAA Airworthiness Directive 2021-05-51, Thermal Acoustic Imaging Inspection Of All Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, And PW4090-3 Turbofan Engines, With 1st-Stage Low-Pressure Compressor (LPC) Blade, Part Numbers 52A241, 55A801, 55A801-001, 55A901, 55A901-001, 56A201, 56A201-001, or 56A221, Installed.
20. FAA Alternative Method Of Compliance letters dated October 14, 2021.

Publications Changed

PW4074, PW4077 Turbofan Engines, Illustrated Parts Catalog, Part No. 51A346.

72-31-00, Figure 2

PW4074D, PW4077D, PW4084D, PW4090, PW4090-3, PW4090D, PW4098 Turbofan Engines, Illustrated Parts Catalog, Part No. 51A742.

72-31-00, Figure 2

Interchangeability

Old and new parts are directly interchangeable.

Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)



## Material Information

### Material — Cost and Availability

1. There is no new material cost to do this Alert Service Bulletin.
2. There is no kit provided to do this Alert Service Bulletin.
3. Part availability information is provided in material data Instructions — Disposition.

### Industry Support Program

Not Applicable.

The material data that follows is for each engine.

**NOTE:** It is possible to use the Chapter/Section and Figure/Item reference number shown below the old part number to find the part in the Illustrated Parts Catalog.

Because there are many different configurations used, it is frequently necessary to show more than one group of parts. When this occurs, parts that are interchangeable are shown line-by-line only, unless this is shown differently.

**CAUTION:** THE FOLLOWING MATERIAL DATA TABLE(S) ARE ORGANIZED BY ILLUSTRATED PARTS CATALOG. ALL PARTS IN THE TABLE(S) MAY OR MAY NOT BE APPLICABLE TO ALL THE ENGINE MODELS SHOWN IN THE TABLE HEADING. YOU MUST REFER TO THE APPROPRIATE ILLUSTRATED PARTS CATALOG FOR ENGINE MODEL APPLICABILITY USING THE OLD PART NUMBER (PN) AND CATALOG SEQUENCE NUMBER. FAILURE TO INSTALL THE PART(S) IN THE CORRECT ENGINE MODEL MAY RESULT IN A CONFIGURATION THAT IS NOT FAA APPROVED.

The material data that follows is for each engine.

For PW4074, PW4077 Engines:

| New PN | Qty | Estimate of Unit Price (\$) | Keyword                       | Old PN                         | Instructions — Disposition |
|--------|-----|-----------------------------|-------------------------------|--------------------------------|----------------------------|
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 52A241<br>(72-31-00-2-1 D)     | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 55A901<br>(72-31-00-2-1)       | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 55A901-001<br>(72-31-00-2-1BA) | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 55A801<br>(72-31-00-2-1 A)     | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 55A801-001<br>(72-31-00-2-1BB) | (4)(X)                     |



| New PN | Qty | Estimate of Unit Price (\$) | Keyword                       | Old PN                         | Instructions — Disposition |
|--------|-----|-----------------------------|-------------------------------|--------------------------------|----------------------------|
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A201<br>(72-31-00-2-1 B)     | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A201-001<br>(72-31-00-2-1BC) | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A221<br>(72-31-00-2-1 C)     | (4)(X)                     |

The material data that follows is for each engine.

For PW4074D, PW4077D, PW4084D, PW4090, PW4090-3 Engines:

| New PN | Qty | Estimate of Unit Price (\$) | Keyword                       | Old PN                         | Instructions — Disposition |
|--------|-----|-----------------------------|-------------------------------|--------------------------------|----------------------------|
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 52A241<br>(72-31-00-2-1 B)     | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A201<br>(72-31-00-2-1)       | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A201-001<br>(72-31-00-2-1BA) | (4)(X)                     |
|        |     |                             | OR                            |                                |                            |
|        | 22  |                             | BLADE — ASSY<br>OF, LPC, 1STG | 56A221<br>(72-31-00-2-1 A)     | (4)(X)                     |

#### Modification and Spares Information

##### Parts Modification Conditions

(4) Do an inspection as specified in the Accomplishment Instructions.

##### Spare Parts Availability

(X) See Reference 2 or 3, Illustrated Parts Catalogs, for applicable replacement parts.

##### Vendor Services or Special Components/Materials

Location For Return Of Fan Blades For Thermal Acoustic Image Inspection

| P&W Designation | Vendor Designation | Name                          | Vendor Name & Address   |
|-----------------|--------------------|-------------------------------|---|
| 52A241          |                    | BLADE — ASSY<br>OF, LPC, 1STG | Pratt & Whitney<br>400 Main Street<br>Well #14<br>East Hartford, CT 06108<br>U.S.A. |
| 55A901          |                    |                               |   |
| 55A901-001      |                    |                               |   |
| 55A801          |                    |                               |   |
| 55A801-001      |                    |                               |   |
| 56A201          |                    |                               |   |
| 56A201-001      |                    |                               |   |
| 56A221          |                    |                               |   |

Material Data for Each Spare Engine

The material for each spare engine is as stated in the preceding material information section.

Reidentified Parts

Not Applicable.

Necessary Tools

Refer to the UT inspection procedures as specified in References 12, 13, and 14, NDIP-1238, NDIP-1240, and NDIP1241, for necessary tools and equipment.

NOTE: To get a copy of the latest FAA Approved UT inspection procedures as specified in References 12, 13, and 14, NDIP-1238, NDIP-1240 and NDIP-1241 (latest FAA approved revisions) respectively, please contact Pratt & Whitney Non Destructive Evaluation (NDE) through the MS Dynamics system or Pratt & Whitney Global Operations Center (24 hour help desk).

NOTE: All queries regarding necessary support equipment and inspection equipment equivalency can be directed to Pratt & Whitney Non Destructive Evaluation (NDE) through the MS Dynamics system or Pratt & Whitney Global Operations Center (24 hour help desk).

Other Material Information Data

Not Applicable.





Accomplishment Instructions

PART A — INITIAL INSPECTION OF ALL LPC FAN BLADES PRIOR TO THEIR RETURN TO SERVICE

1. You must do a UT inspection of all LPC fan blades which have any number of cycles greater than zero prior to return to service after the issue date of this alert service bulletin as follows:
  - A. Do a UT inspection of the LPC fan blade convex side flow path area as specified in Reference 12, NDIP-1238, latest FAA approved revision.
  - B. Do a UT inspection of the LPC fan blade convex side mid span area as specified in Reference 13, NDIP-1240, latest FAA approved revision.
  - C. Do a UT inspection of the LPC fan blade concave side mid span area as specified in Reference 14, NDIP-1241, latest FAA approved revision.

NOTE: To get a copy of the UT inspection procedures as specified in References 12, 13, and 14, NDIP-1238, NDIP-1240 and NDIP-1241 (latest FAA approved revisions) respectively, please contact Pratt & Whitney Non Destructive Evaluation (NDE) through the MS Dynamics system or Pratt & Whitney Global Operations Center (24 hour help desk).

2. For LPC fan blades that have 1000 cycles or more since new or last TAI inspection, do a TAI inspection of the LPC fan blade as specified in Reference 8, CIR Manual 51A750, Chapter/Section 72-31-82, Inspection/Check-02, paragraph 1. H., Thermal Acoustic Image Inspection (Vendor Application).
3. If the cycles since the LPC fan blade was new cannot be determined OR the cycles since the last TAI inspection cannot be determined, the LPC fan blade must be TAI inspected, as specified in Reference 8, CIR Manual 51A750, Chapter/Section 72-31-82, Inspection/Check-02, paragraph 1. H., Thermal Acoustic Image Inspection (Vendor Application).
4. It is not necessary to UT or TAI inspect new LPC fan blades with zero cycles prior to their use in service. However these LPC fan blades must comply with the repetitive inspection requirements in Part B.

NOTE: Credit may be taken for TAI inspections in accordance with Reference 11, Special Instruction No. 29F-21 — PW4000-112 Hollow Fan Blade Thermal Acoustic Imaging Inspection Special Instruction, dated February 22, 2021, performed prior to issuance of this Alert Service Bulletin.

NOTE: Credit may be taken for UT inspections in accordance with Reference 15, Special Instruction No. 85F-21 — PW4000-112 Hollow Fan Blade Ultrasonic Inspection Development & Data, dated May 12, 2021, performed prior to issuance of this Alert Service Bulletin.

NOTE: Credit may be taken for UT inspections in accordance with Reference 16 and 17, Special Instruction No. 130F-21 — PW4000-112 Hollow Fan Blade Ultrasonic Inspection Special Instruction For Blades Which Have Accumulated 1000 Cycles Or Fewer Since Last Thermal Acoustic Imaging Inspection, Original Issue, dated July 1, 2021, and Revision A, dated July 28, 2021 respectively, done prior to issuance of this Alert Service Bulletin.



PART B — REPETITIVE INSPECTION OF ALL LPC FAN BLADES AFTER THEIR RETURN TO SERVICE

1. For LPC fan blades that have returned to service after meeting the requirements of Part A above, do repetitive UT and TAI inspections as follows:
  - A. Do a UT inspection of the LPC fan blade convex side flow path area every 275 cycles maximum as specified in Reference 12, NDIP-1238, latest FAA approved revision.
  - B. Do a UT inspection of the LPC fan blade convex side mid span area every 550 cycles maximum as specified in Reference 13, NDIP-1240, latest FAA approved revision.
  - C. Do a UT inspection of the LPC fan blade concave side mid span area every 550 cycles maximum as specified in Reference 14, NDIP-1241, latest FAA approved revision.
  - D. Do a TAI inspection of the LPC fan blades every 1000 cycles maximum as specified in Reference 8, CIR Manual 51A750, Chapter/Section 72-31-82, Inspection/Check-02, paragraph 1. H., Thermal Acoustic Image Inspection (Vendor Application).

NOTE: To get a copy of the UT inspection procedures as specified in the Reference 12, 13, and 14, NDIP-1238, NDIP-1240, and NDIP-1241 (latest FAA approved revisions) respectively, please contact Pratt & Whitney Non Destructive Evaluation (NDE) through the MS Dynamics system or Pratt & Whitney Global Operations Center (24 hour help desk).

PART C — LPC FAN BLADE INSPECTIONS FOR ENGINES INSTALLED ON AIRCRAFT

NOTE: Service Bulletin incorporation on engines installed on aircraft may be desirable and should be individually evaluated.

NOTE: The UT Inspection can be accomplished with the LPC fan blades installed in the engine or they may be removed from the engine for the UT inspection. It is necessary to remove the fan blade fairings to accomplish UT inspection when the LPC fan blades are installed in the engine, and it is necessary to remove the LPC fan blades and return them to the approved source listed in the Vendor Services Section for TAI inspection.

1. For engines installed on aircraft that require UT inspection in accordance with the intervals in this Alert Service Bulletin, remove necessary hardware for access to accomplish UT inspection as follows:

ENGINES INSTALLED ON AIRCRAFT, INSPECTION OF REMOVED FAN BLADES

- A. Remove the LPC fan blades as specified in Reference 6, Boeing 777 Aircraft Maintenance Manual, Chapter/Section 72-31-02.

ENGINES INSTALLED ON AIRCRAFT, INSPECTION OF INSTALLED FAN BLADES

- A. Remove the fan blade fairings as specified in Reference 6, Boeing 777 Aircraft Maintenance Manual, Chapter/Section 72-31-07.
2. The removal of LPC Fan Blades, PN 52A241, PN 55A901, PN 55A901-001, PN 55A801, PN 55A801-001, PN 56A201, PN 56A201-001, and PN 56A221, for UT and/or TAI inspection is dictated by the initial inspection requirements and/or repetitive inspection intervals in this Alert Service Bulletin. When removal of LPC fan blades is dictated by these intervals, do as follows:
  - A. Remove the LPC fan blades as specified in Reference 6, Boeing 777 Aircraft Maintenance Manual, Chapter/Section 72-31-02.



- B. Return the LPC fan blades for TAI inspection to the approved source listed in the Vendor Services section.
3. If necessary, replace the removed LPC fan blades as specified in Reference 6, Boeing 777 Aircraft Maintenance Manual, Chapter/Section 72-31-02.
4. If necessary, replace the removed fan blade fairings as specified in Reference 6, Boeing 777 Aircraft Maintenance Manual, Chapter/Section 72-31-07.

**PART D — LPC FAN BLADE INSPECTIONS FOR ENGINES NOT INSTALLED ON AIRCRAFT**

**NOTE:** The UT Inspection can be accomplished with the LPC fan blades installed in the engine or they may be removed from the engine for the UT inspection. It is necessary to remove the fan blade fairings to accomplish UT inspection when the LPC fan blades are installed in the engine, and it is necessary to remove the LPC fan blades and return them to the approved source listed in the Vendor Services Section for TAI inspection.

1. For engines not installed on aircraft that require UT inspection in accordance with the intervals in this Alert Service Bulletin, remove necessary hardware for access to accomplish UT inspection as follows:

**ENGINES NOT INSTALLED ON AIRCRAFT, INSPECTION OF REMOVED FAN BLADES**

- A. Remove the LPC fan blades as specified in Reference 4 or 5, EM, Chapter/Section 72-00-31, Removal-03.

**ENGINES NOT INSTALLED ON AIRCRAFT, INSPECTION OF INSTALLED FAN BLADES**

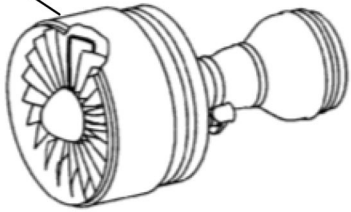
- A. Remove the fan blade fairings as specified in Reference 4 or 5, EM, Chapter/Section 72-00-31, Removal-03.
2. The removal of LPC Fan Blades, PN 52A241, PN 55A901, PN 55A901-001, PN 55A801, PN 55A801-001, PN 56A201, PN 56A201-001, and PN 56A221, for UT and/or TAI inspection is dictated by the initial inspection requirements and/or repetitive inspection intervals in this Alert Service Bulletin. When removal of LPC fan blades is dictated by these intervals, do as follows:
  - A. Remove the LPC fan blades as specified in Reference 4 or 5, EM, Chapter/Section 72-00-31, Removal-03.
  - B. Return the LPC fan blades for TAI inspection to the approved source listed in the Vendor Services Section.
3. If necessary, replace the removed LPC fan blades as specified in Reference 4 or 5, EM, Chapter/Section 72-00-31, Installation-03.
4. If necessary, replace the removed fan blade fairings as specified in Reference 4 or 5, EM, Chapter/Section 72-00-31, Installation-03.



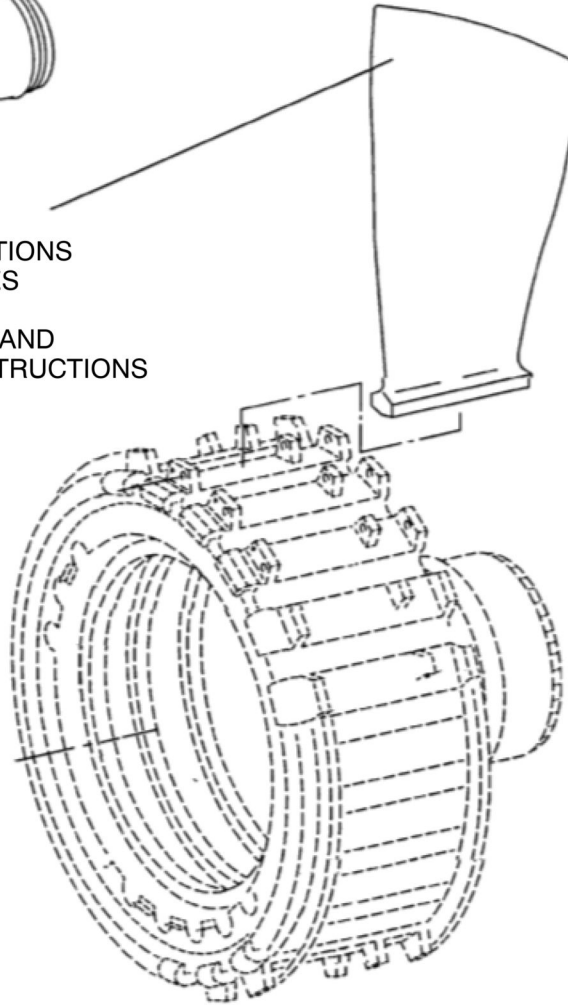
**Pratt & Whitney**

A United Technologies Company

A



DO UT AND TAI INSPECTIONS  
OF THE LPC FAN BLADES  
AS SPECIFIED IN THE  
COMPLIANCE SECTION AND  
ACCOMPLISHMENT INSTRUCTIONS  
(22 LOCATIONS)



A

B529917

LOCATION OF THE LPC FAN BLADES  
72-31-00  
FIGURE 1

October 15/21

**PW4G-112-A72-361**

Page 12



Appendix

Added Data

Internal Reference Information

| Revision No. | Reference Document | Origination |
|--------------|--------------------|-------------|
| Original     | EA21KC035          | ERB/TAF     |

Reference 20, FAA Alternate Method of Compliance letters follow:



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Compliance and Airworthiness Division

ECO Branch  
1200 District Avenue  
Burlington, MA 01803  
(781) 238-7140, Fax: (781) 238-7199

October 14, 2021

John Verbeke  
PW4000-94/100/112 Global Fleet Chief  
400 Main Street  
East Hartford, CT, 06108  
USA

Subject: Pratt & Whitney Global Alternative Method of Compliance (AMOC) to  
Airworthiness Directive (AD) 2019-03-01

Dear Mr. John Verbeke:

The Federal Aviation Administration (FAA) ECO Branch received your email dated October 13, 2021 requesting a Global AMOC to FAA AD 2019-03-01, paragraph (g)(1) and (2), for the Pratt & Whitney PW4000-112" engine. Paragraph (g)(1) of FAA AD 2019-03-01 requires an initial Thermal Acoustic Image (TAI) inspection of the 1st-stage LPC blades. Paragraph (g)(2) of FAA AD 2019-03-01 requires repetitive TAI inspection of the 1st-stage LPC blades at every M-flange separation.

Pratt & Whitney Global AMOC proposal would use Ultrasonic Testing (UT) inspection and TAI inspections methods and repeat intervals per Alert Service Bulletin (ASB) PW4G-112-A72-361, initial release, Accomplishment Instructions, Part A and B, for compliance with paragraph (g)(1) and (2), respectively.

ASB PW4G-112-A72-361, initial release, Accomplishment Instructions, Part A, requires the following inspections on the 1st-stage LPC blades before further flight:

- UT inspect all blades with any service cycles
  - new blades with zero flight cycles are exempted
- TAI inspect blades that fall into one of the following categories:
  - blades with 1000 flight cycles or more since new or previous TAI inspection
  - blades with unknown flight cycles since new or last TAI inspection

ASB PW4G-112-A72-361, initial release, Accomplishment Instructions, Part B, requires the following repetitive inspections on the 1st-stage LPC blades:

- UT inspect the flow path location every 275 flight cycles
- UT inspect the mid span locations every 550 flight cycles
- TAI inspect every 1000 flight cycles

The ECO Branch has reviewed your proposal and has determined that inspecting the 1st-stage LPC blades using the inspection methods and repeat intervals in ASB PW4G-112-A72-361, initial release, Accomplishment Instructions, Part A and B, establish an

acceptable level of safety, and we therefore approve your Global AMOC proposal to paragraph (g)(1) and (2) of FAA AD 2019-03-01.

We have determined that this AMOC is of general applicability to the Pratt & Whitney PW4000-112" engine type design, and therefore this letter is issued to Pratt & Whitney with the understanding that it may subsequently be distributed to operators. Operators may then use this letter, along with evidence of compliance with the terms of this letter, to document compliance to FAA AD 2019-03-01.

This FAA AMOC is transferable with the 1st-stage LPC blades to another owner/operator who operates the aircraft under U.S. registry.

Before using this AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local Flight Standards District Office/Certificate Holding District Office.

The preceding paragraph also applies to any applicable foreign-registered aircraft upon transfer of the aircraft to the U.S. registry if compliance with the AMOC has not been accomplished.

All provisions of FAA AD 2019-03-01 that are not specifically referenced above remain fully applicable and must be complied with accordingly.

This AMOC only applies to the FAA AD listed above. The FAA does not have the authority to approve this as an AMOC to any AD issued by another civil aviation authority (CAA). Approval of an AMOC to another CAA's AD must come from that CAA. A copy of this response will be forwarded to the CAA where these aircraft are registered for their consideration.

If you have any questions or need additional information, please contact Carol Nguyen at telephone 781-238-7655, fax 781-238-7199, or electronic mail at [carol.nguyen@faa.gov](mailto:carol.nguyen@faa.gov).

Sincerely,

MARTIN B ADLER  Digitally signed by MARTIN B ADLER  
Date: 2021.10.14 19:02:07 -04'00'

(For)  
Tomasz Rakowski  
Manager, ECO Branch  
Compliance and Airworthiness Division



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Compliance and Airworthiness Division

ECO Branch  
1200 District Avenue  
Burlington, MA 01803  
(781) 238-7140, Fax: (781) 238-7199

October 14, 2021

John Verbeke  
PW4000-94/100/112 Global Fleet Chief  
400 Main Street  
East Hartford, CT, 06108  
USA

Subject: Pratt & Whitney Global Alternative Method of Compliance (AMOC) to  
Airworthiness Directive (AD) 2021-05-51

Dear Mr. John Verbeke:

The Federal Aviation Administration (FAA) ECO Branch received your email dated October 13, 2021 requesting a Global AMOC to FAA AD 2021-05-51, paragraph (g)(1), for the Pratt & Whitney PW4000-112" engine. Paragraph (g)(1) of FAA AD 2021-05-51 requires a one-time Thermal Acoustic Image (TAI) inspection of the 1st-stage LPC blades before further flight.

Pratt & Whitney Global AMOC proposal would use Ultrasonic Testing (UT) inspection and TAI inspections methods per Alert Service Bulletin (ASB) PW4G-112-A72-361, Accomplishment Instructions, Part A, for compliance with paragraph (g)(1).

ASB PW4G-112-A72-361, Accomplishment Instructions, Part A, requires the following inspections on the 1st-stage LPC blades before further flight:

- UT inspect all blades with any service cycles
  - new blades with zero flight cycles are exempted
- TAI inspect blades that fall into one of the following categories:
  - blades with 1000 flight cycles or more since new or previous TAI inspection
  - blades with unknown flight cycles since new or last TAI inspection

The ECO Branch has reviewed your proposal and has determined that inspecting the 1st-stage LPC blades using the inspection methods in ASB PW4G-112-A72-361, Accomplishment Instructions, Part A, establish an acceptable level of safety, and we approve your Global AMOC proposal to paragraph (g)(1) of FAA AD 2021-05-51.

We have determined that this AMOC is of general applicability to the Pratt & Whitney PW4000-112" engine type design, and therefore this letter is issued to Pratt & Whitney with the understanding that it may subsequently be distributed to operators. Operators may then use this letter, along with evidence of compliance with the terms of this letter, to document compliance to FAA AD 2021-05-51.



This FAA AMOC is transferable with the 1st-stage LPC blades to another owner/operator who operates the aircraft under U.S. registry.

Before using this AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local Flight Standards District Office/Certificate Holding District Office.

The preceding paragraph also applies to any applicable foreign-registered aircraft upon transfer of the aircraft to the U.S. registry if compliance with the AMOC has not been accomplished.

All provisions of FAA AD 2021-05-51 that are not specifically referenced above remain fully applicable and must be complied with accordingly.

This AMOC only applies to the FAA AD listed above. The FAA does not have the authority to approve this as an AMOC to any AD issued by another civil aviation authority (CAA). Approval of an AMOC to another CAA's AD must come from that CAA. A copy of this response will be forwarded to the CAA where these aircraft are registered for their consideration.

If you have any questions or need additional information, please contact Carol Nguyen at telephone 781-238-7655, fax 781-238-7199, or electronic mail at [carol.nguyen@faa.gov](mailto:carol.nguyen@faa.gov).

Sincerely,

**MARTIN B ADLER**

Digitally signed by MARTIN B ADLER  
Date: 2021.10.14 19:11:19 -04'00'

(For)

Tomasz Rakowski

Manager, ECO Branch

Compliance and Airworthiness Division